

WHAT IS CLAIMED IS:

- SUB
A1
1. A semiconductor device, comprising:
a source region formed of a semiconductor;
a drain region formed of a semiconductor of the same conductive type as that of said source region;
a channel region formed of a semiconductor between said source region and said drain region;
a gate insulating film provided on said channel region; and
a gate electrode provided on said gate insulating film and formed with a P-N junction including a P-type semiconductor region and an N-type semiconductor region,
wherein said P-type semiconductor region and said N-type semiconductor region of said P-N junction of said gate electrode are electrically insulated.
- B3
2. The semiconductor device according to claim 1,
wherein silicide is not formed on said P-N junction of said gate electrode.
3. The semiconductor device according to claim 1,
wherein said P-N junction of said gate electrode is covered with an insulating material.
4. The semiconductor device according to claim 3,
wherein silicide is formed on a part of said gate electrode which is not covered with said insulating

B3 material.

5. The semiconductor device according to claim 1,

wherein said gate electrode includes a first gate portion provided above said channel region and a second gate portion provided above a region which is not said channel region, and

said second gate portion includes said P-N junction.

6. The semiconductor device according to claim 5, further comprising;

a body region formed of a semiconductor under said channel region;

a buried insulating film provided under said body region, said source region, and said drain region; and

a semiconductor substrate region provided under said buried insulating film.

7. The semiconductor device according to claim 1,

wherein silicide is formed on surfaces of said source region and said drain region.

8. The semiconductor device according to claim 6, further comprising;

a body contact region formed within said body region and having a higher impurity concentration than said body region.

9. The semiconductor device according to claim

8,

B3 wherein said body contact region is formed in a region outside said second gate portion.

10. A method for fabricating a semiconductor device, comprising the steps of:

(a) preparing a semiconductor substrate including a silicon region;

(b) forming a gate insulating film on said semiconductor substrate;

(c) forming a gate electrode on said gate insulating film;

(d) forming a first insulating film on said gate electrode;

(e) forming a source region and a drain region on said semiconductor substrate by performing ion-implantation with using said first insulating film as a mask;

(f) forming a metallic layer on a surface of said semiconductor substrate while leaving said first insulating film on said gate electrode so that silicide is formed at an interface between said source region and said metallic layer and an interface between said drain region and said metallic layer and that no silicide is formed on a surface of said gate electrode; and

(g) removing said metallic layer to leave said silicide. A

11. The method for fabricating the semiconductor

device according to claim 10, further comprising the step of:

(h) exposing a surface of said gate electrode after said step (g).

12. The method for fabricating the semiconductor device according to claim 10,

wherein said step (a) is a step of preparing an SOI substrate in which a silicon layer is formed on an insulating material, and

said step (e) is a step of forming said source region and said drain region in said silicon layer.